

such tables have been composed. Easy as one might at first suppose to be the diagnosis of a musket-ball wound of the chest, whether penetrating or non-penetrating, experience shows that it is not so. Partial circuits of balls beneath the integuments and the muscles of this region, beneath the scapula, perhaps complicated with great bruising, fracture, hemorrhage, and attended with dyspnoea, hæmoptysis, and faintness, deceive the unwary at once into the belief that the chest must have been opened and traversed by the ball when the pleura has escaped entire. The circumstances of field hospitals for some time after a battle too often add to the chances of inaccurate diagnosis of particular wounds, and errors, once made, are not likely to be changed in the tabular returns, although the nature of each case may be more truly arrived at in the secondary or general hospitals, through which the patients subsequently pass. I have repeatedly seen cases returned as *penetrating wounds*, in which I have been able to demonstrate satisfactorily that the cavity of the chest has not been exposed at all. You will find several such cases described by me in the last volume of the *Army Medical Reports*, under Wounds of the Chest. If, as has been stated, a field hospital should be established in America for the reception of gunshot wounds of the chest, and the cases be submitted to the treatment I have been commenting upon, it is especially to be hoped that the diagnosis in each case shall be in the first instance established and defined as accurately as possible, so that the value of the observations made on the effects of this treatment, and of the tabular deductions as to its final results, may not be impaired by any doubts as to the nature of the series of cases which have been subjected to it.

"No pains appear to be spared by the authorities in America to encourage energetic investigations of this nature; and under the able direction of the energetic Surgeon-General, Dr. Hammond, and from the observations of the hundreds of medical officers who are labouring in the immense field of campaigning practice which is now afforded in that country, we have every right to expect that great advances will be made there in the science of Military Surgery."

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*Ligature of the Left Subclavian inside the Scalenus Muscle, together with Common Carotid and Vertebral Arteries for Subclavian Aneurism. Hemorrhage from the distal end of the Subclavian. Death on 42d day.*—Professor PARKER presented to the New York Pathological Society, October 28, 1863, a specimen of subclavian aneurism of the right side, which he had removed from the body of a man with the following history: During the month of August, 1862, a swelling about the size of a walnut made its appearance, without assignable cause, above the centre of the patient's right clavicle. It did not increase for a period of seven months, when it began slowly to enlarge, so that at the end of a year, when Dr. Parker was first consulted, it had attained the size of a hen's egg.

The diagnosis of aneurism was at once made, and the patient was advised to remain for some time quietly at home, take no violent exercise, and live upon vegetable diet. When he was next seen, the tumour had increased somewhat in size, and by pressure upon the axillary plexus, had given rise to considerable pain in the arm of the affected side. He was advised to submit either to the operation of ligation of the subclavian artery with its uncertain results, or to amputation at the shoulder-joint. At the end of four or five weeks, the patient again presented himself; the tumour had then very much increased in size, and he was suffering extremely from pain in the right arm. He was then admitted (September 2, 1863) to the New York Hospital. His nights were sleepless, and there was a very singular change in his circulation. When last seen, the pulsations in each wrist were regular, and numbered 76; now the pulsations in the right wrist could hardly be appreciated, and on the left side there was nearly the same condition of things present. The pulsation of his carotid varied from 120 to 130. A consultation, which was called, resulted in a decision to tie the common carotid near the bifurcation, and secure a good plug, and also the subclavian inside the scalenus muscle, together with the vertebral artery. It was thought best to ligate the vertebral artery, in order to guard against the acci-

dent which occurred in Kearney Rodgers's case of ligature of the left subclavian in 1845. Dr. Rodgers applied a ligature just inside the vertebral artery, in the first division. His patient went on very well until the fourteenth or fifteenth day, when he died of secondary hemorrhage, the result of the recurrent circulation through the vertebral into the subclavian. On the proximal side of the ligature was a well-formed plug, but on the distal side there was of course no coagulum whatever.

The operation was entered upon, and the ligatures applied without difficulty. The pulsations in the tumour immediately ceased, as did also the intense pain in the arm. The case progressed exceedingly well until the tenth day, when there was a slight hemorrhage, which, however, was easily controlled. On the twelfth day the ligature from the vertebral artery came away. September 17th, ligature of carotid came away; this was followed by a slight hemorrhage, which, however, had nothing to do with the artery itself. The ligature from the subclavian did not come away until the 26th, twenty-four days after the operation. On the 29th there was a slight and easily controlled hemorrhage. Oct. 1st. Suppuration from the wound was very free; although nature had done a good deal towards closing the opening, the tissues gradually broke away under the influence of pressure, and of the persulphate of iron, which had been used to check the bleeding. Oct. 7. Hemorrhage to the extent of three ounces, and pretty free. In the evening hemorrhage again, about one ounce. He rallied, however, from all this until the forty-second day after the operation, when hemorrhage again occurred, and he died.

The autopsy was made four hours post-mortem, by Dr. Sands, assisted by the gentlemen of the house-staff. The following is his report:—

Right sterno-mastoid removed; clavicles on either side sawn across at the junction of the outer with the middle third; and the sternal portion removed, together with the sternum, the costal cartilage having been previously divided; pericardium opened, and an incision made into the aorta, through which a pipe was introduced, and water injected upwards. After a considerable quantity of water was thrown into the vessels, some of it was seen to issue from what was afterwards found to be the distal end of the right subclavian artery; more escaping, however, from the proximal end. The water also appeared through the left internal mammary, which had been cut in raising the sternum, but more through the right internal mammary, although this had likewise been divided. The wound was deep, extensive ulceration having taken place to the right of the trachea; at its bottom was a round opening, which, upon examination, proved to be the distal extremity of the subclavian artery. The common carotid artery, internal jugular vein, and pneumogastric, were matted together by inflammatory products, as were the tissues generally in the neighborhood of the wound. The carotid artery, beyond the point which had been tied, was occupied by a firm plug that extended nearly to its bifurcation. The proximal portion of the carotid, as well as that of the subclavian, had been destroyed by ulceration, so that the bifurcation of the innominate was no longer visible. The latter vessel presented an open mouth with jagged ulcerated edges, and was filled by a firm fibrinous plug, which occupied nearly its entire length, and projected slightly through its open extremity. The distal end of the subclavian had ulcerated away, carrying with it the proximal portion of the vertebral, the distal portion of the latter being found well plugged. Excepting the vertebral, all the branches of the subclavian were found, and were seen to have their normal relation with the main trunk. They were also pervious, as was shown by the fact that they all admitted a probe introduced through the open end of the subclavian, before described as lying at the bottom of the wound. It was evident, therefore, that the patient had died of hemorrhage from the distal end of the subclavian, the blood having found its way into the latter by the recurrent circulation. The aneurismal sac was larger than a hen's egg, and nearly filled with coagula. The axillary artery beyond the aneurism was healthy and unobstructed.

Several important morbid alterations were noticed on the left side of the neck. The left internal jugular vein was entirely obstructed by a plug of a brownish-yellow color, evidently an old coagulum. The left subclavian artery, just beyond

the origin of its branches, became suddenly smaller than natural, and on examination was discovered to be obliterated for five-eighths of an inch, beyond which it again assumed its normal size and appearance. The occlusion of the vessel seemed to have been the result of inflammation, the coats being thickened and indurated.

Dr. PARKER stated in conclusion that the operation for ligature of the subclavian had been performed in all eleven times by the following surgeons: I. Colles, in 1811, death occurring from hemorrhage on the fourth day; II. Mott, in 1833, death from hemorrhage on the eighteenth day; III. Hayden, in 1835, death from hemorrhage on the twelfth day; IV. O'Reilly, in 1836, death by hemorrhage on the twenty-third day; V. Partridge, in 1841, death from pericarditis and pleuritis on the fourth day; VI. and VII. Liston, in two cases—in the first, 1837, death occurred from hemorrhage on the thirteenth day, and in the second, 1839, death from the same cause on the thirty-sixth day; VIII. and IX. Auverte, in two cases; in both, death was the result of hemorrhage, in the first on the twenty-second, and in the second on the eleventh day. X. Rodgers' case, already referred to; XI. Lastly, Cuvellier, in 1860, death from hemorrhage on the tenth day—carotid and subclavian of right side ligatured.

Dr. BUCK remarked—A case invested with deeper interest than the one before us could scarcely be presented for our consideration. From the post-mortem dissection just described and the specimen exhibited, it appears that, notwithstanding the direct and reverse arterial currents had been intercepted by the ligatures applied to the subclavian, common carotid, and vertebral arteries, the success of the operation was defeated by the circulation still kept up in the aneurismal sac by means of the thyroid axis, internal mammary, and superior intercostal branches. The anastomoses of the terminal branches of the right inferior thyroid with those of the superior of the same side, and also of the internal mammary with the epigastric, must have afforded the channels for restoring and keeping up the circulation in the sac, and thus the formation of coagulum within its cavity has been prevented. Though the ligature upon the subclavian had completely divided the artery, leaving both ends open and exposed, the plug on the proximal side of the ligature had filled up the innominate, and closed it so impermeably as not to permit the passage of water injected at the root of the aorta. On the distal side of this ligature, however, the open mouth of the artery communicated immediately with the sac, and had furnished the repeated hemorrhages preceding death.

The question here suggests itself—Would the ligation of the thyroid axis, the internal mammary, and superior intercostal, in addition to the vertebral, have arrested all circulation in the aneurismal sac, and thus secured the conditions of success. It appears to me that it would have done so, and it is my firm conviction that this expedient ought to be tried, before we concede the impossibility of curing aneurism of the outer division of the subclavian artery by an operation.—*Am. Med. Times*, March 5, 1864.

*Ligature of the Subclavian Artery.*—Dr. ARMSBY, of Albany, has performed this operation on a healthy, robust man, 28 years of age, who had his right arm shattered by the accidental discharge of a cannon, July 7th, 1863.

Gangrene commenced on the second day, and on the third Dr. A. amputated near the shoulder. The stump healed kindly, and on the 12th day after the amputation he was able to go out, and soon after resumed his active business pursuits. His health remained good until September, when the stump began to swell and be painful, and on the 10th of November Dr. A. detected an aneurismal tumour; this tumour increased rapidly, elevating the bones of the shoulder, the pectoral muscles, and filling the axilla. The skin soon after gave way, and the patient lost by a sudden and rapid hemorrhage between two and three quarts of blood, causing faintness and almost loss of pulse. The opening was closed by compresses and adhesive plaster. The only chance of saving life seemed to be by ligation of the subclavian artery above the clavicle, which was performed by Dr. Armsby, on the 19th of November, 1863. The patient was placed on his back, with his face turned to the left. The first incision was about half an inch above and parallel with the superior border of the clavicle, extending from